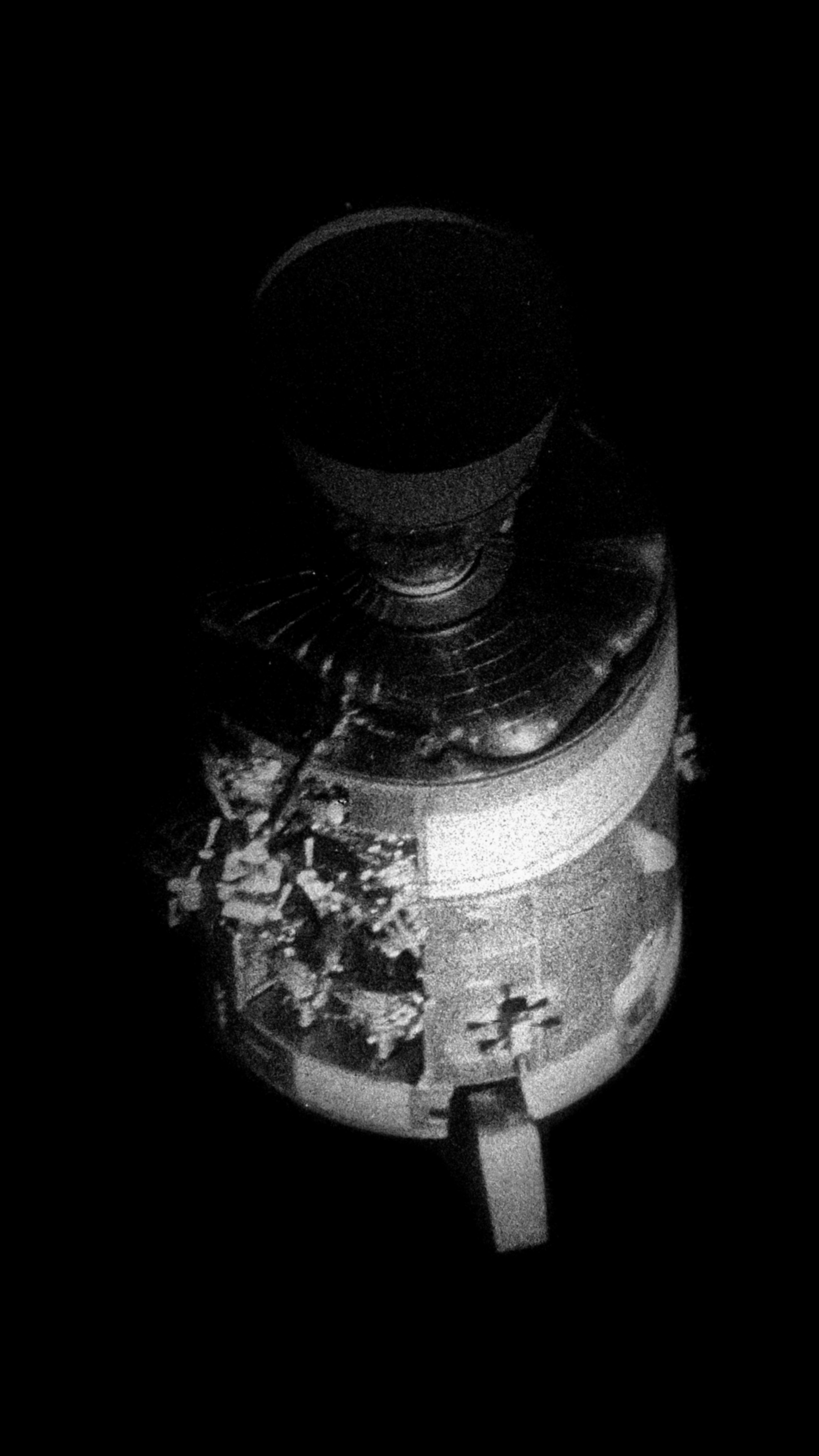
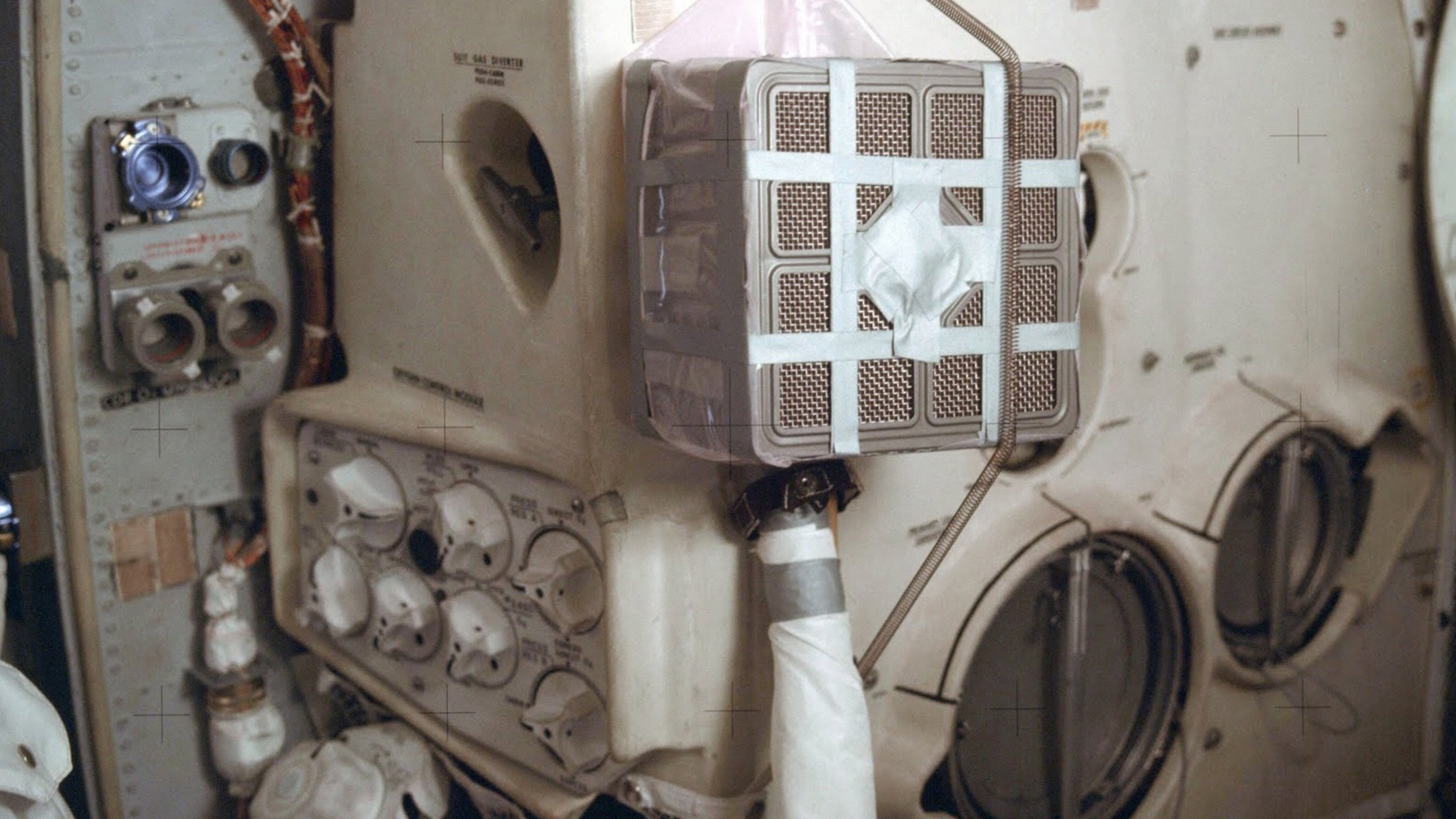


Risk

Hacks


HOT GAS DIVERTER

Automation

Monitoring and Troubleshooting

Solutions, lessons learned and what not to do

One Engineer's Rant

Brendan Cleary, Lance Dryden, Francisco Hidalgo, Peter Hoose, Ernesto Ovcharenko, Petr Lapukhov, Jose Leitao, James Paussa, Jimmy Williams, Nathan Bronson

Peter Hoose
packet loss hater, facebook

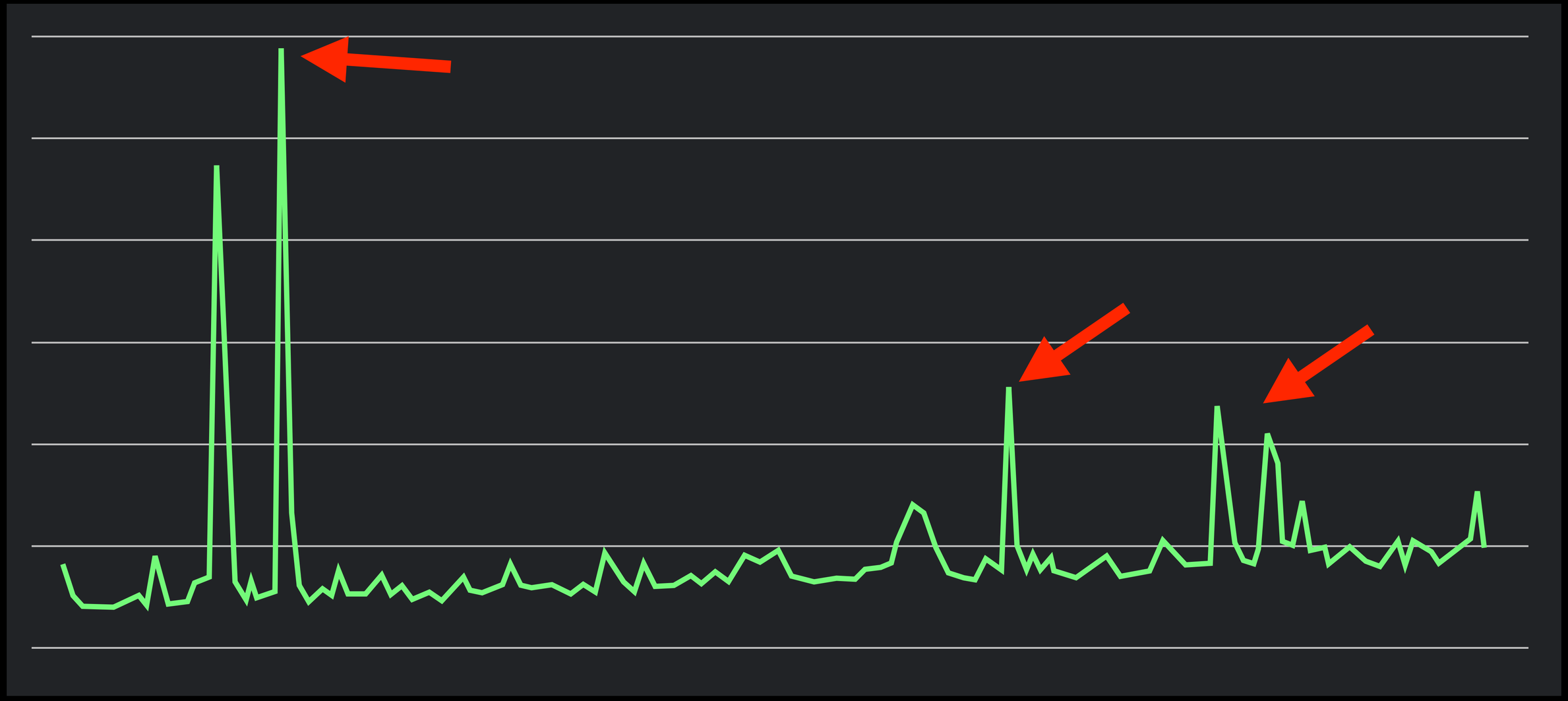
facebook

Myths

- Automation fixes everything
- We’ve fixed everything
- Doesn’t apply

Microbursts

Microbursts



Re-transmits per second

Microbursts

```
router1# show int eth18/1
Ethernet18/1 is up
admin state is up, Dedicated Interface
  …
  MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec
  …
  Last link flapped 7week(s) 5day(s)
  …
   input rate 1.75 Gbps, 325.01 Kpps; output rate 2.10 Gbps, 371.97 Kpps
  RX
    …
    0 jumbo packets  0 storm suppression packets
    0 runts  0 giants  0 CRC  0 no buffer
    0 input error  0 short frame  0 overrun   0 underrun  0 ignored
    0 watchdog  0 bad etype drop  0 bad proto drop  0 if down drop
    0 input with dribble  0 input discard
    0 Rx pause
  TX
    …
    0 jumbo packets
    0 output error  0 collision  0 deferred  0 late collision
    0 lost carrier  0 no carrier  0 babble  0 output discard
    0 Tx pause

router1#
```

Microbursts

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    0 output error  0 collision  0 deferred  0 late collision
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    0 Tx pause

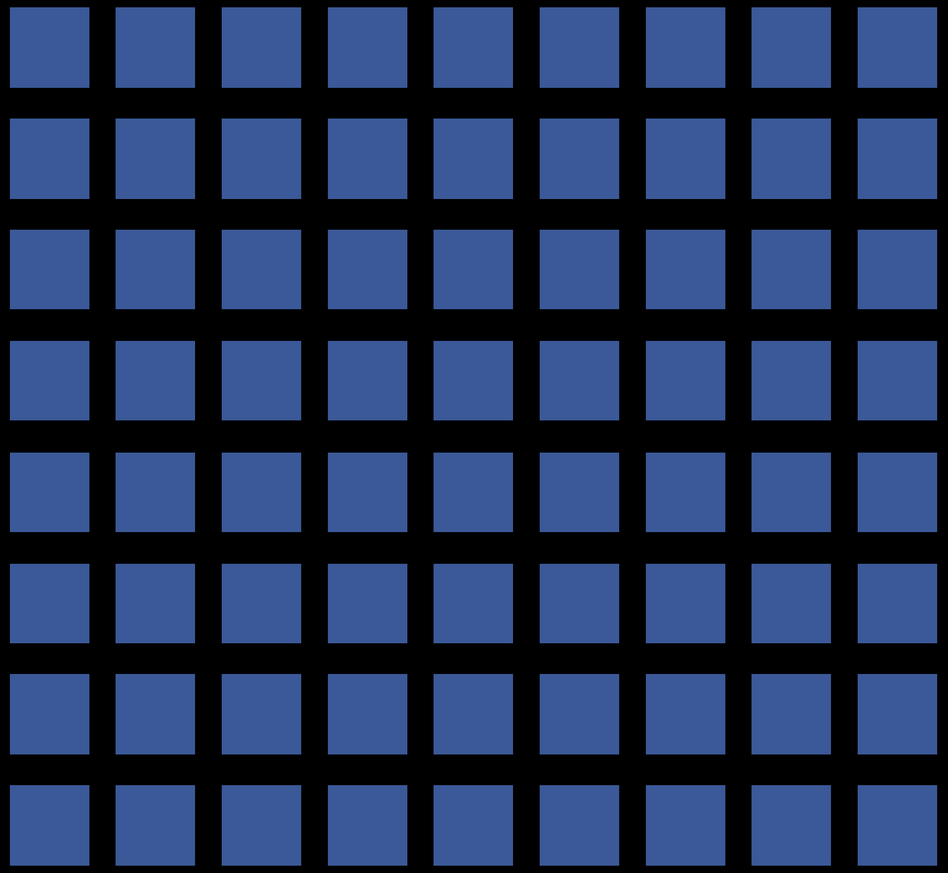
router1#
```

Microbursts

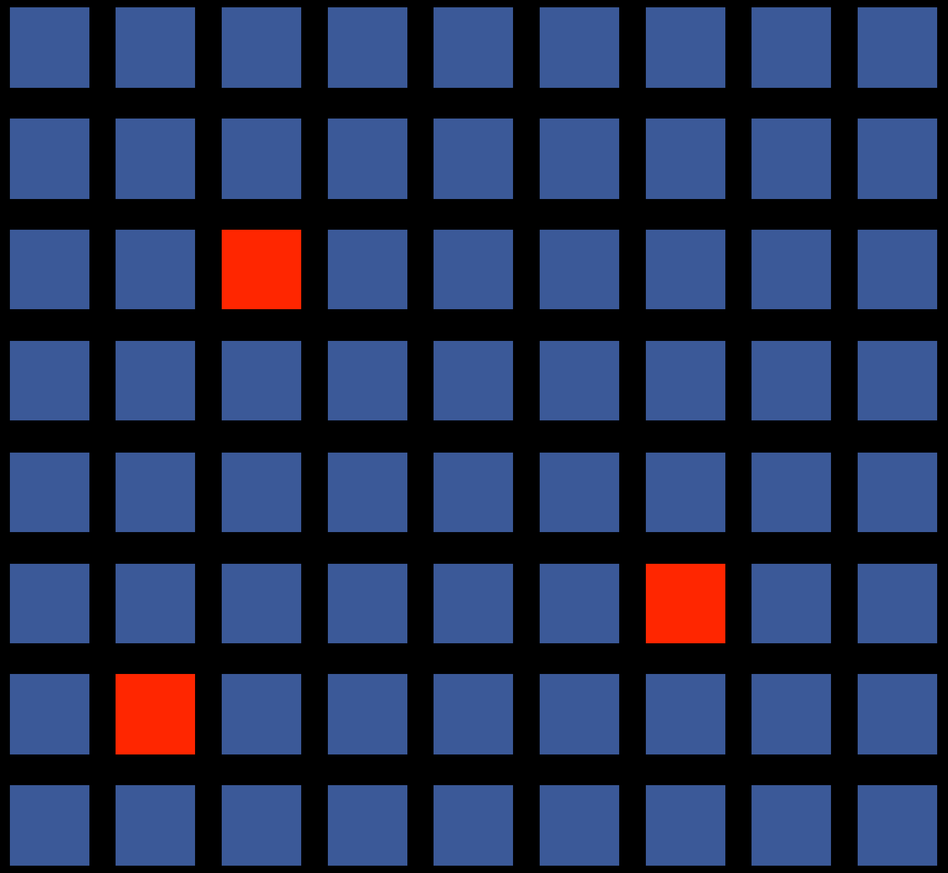
```
[root@localhost# hping -S 192.168.0.100
HPING 192.168.0.100 (eth0 192.168.0.100): S set, 40 headers + 0 data bytes
len=46 ip=192.168.0.100 ttl=128 id=19314 sport=0 flags=RA seq=0 win=0 rtt=0.5 ms
len=46 ip=192.168.0.100 ttl=128 id=19316 sport=0 flags=RA seq=1 win=0 rtt=0.5 ms
len=46 ip=192.168.0.100 ttl=128 id=19317 sport=0 flags=RA seq=2 win=0 rtt=0.4 ms
— 192.168.0.100 hping statistic —
4 packets tramitted, 3 packets received, 25% packet loss
round-trip min/avg/max = 0.4/0.8/1.6 ms
[root@localhost]#
```

25% packet loss

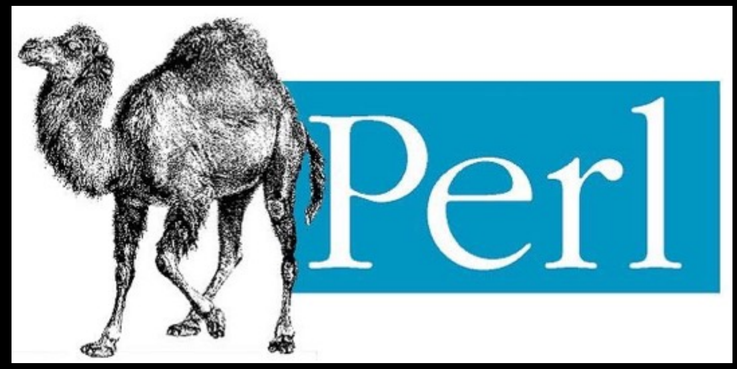
Microbursts



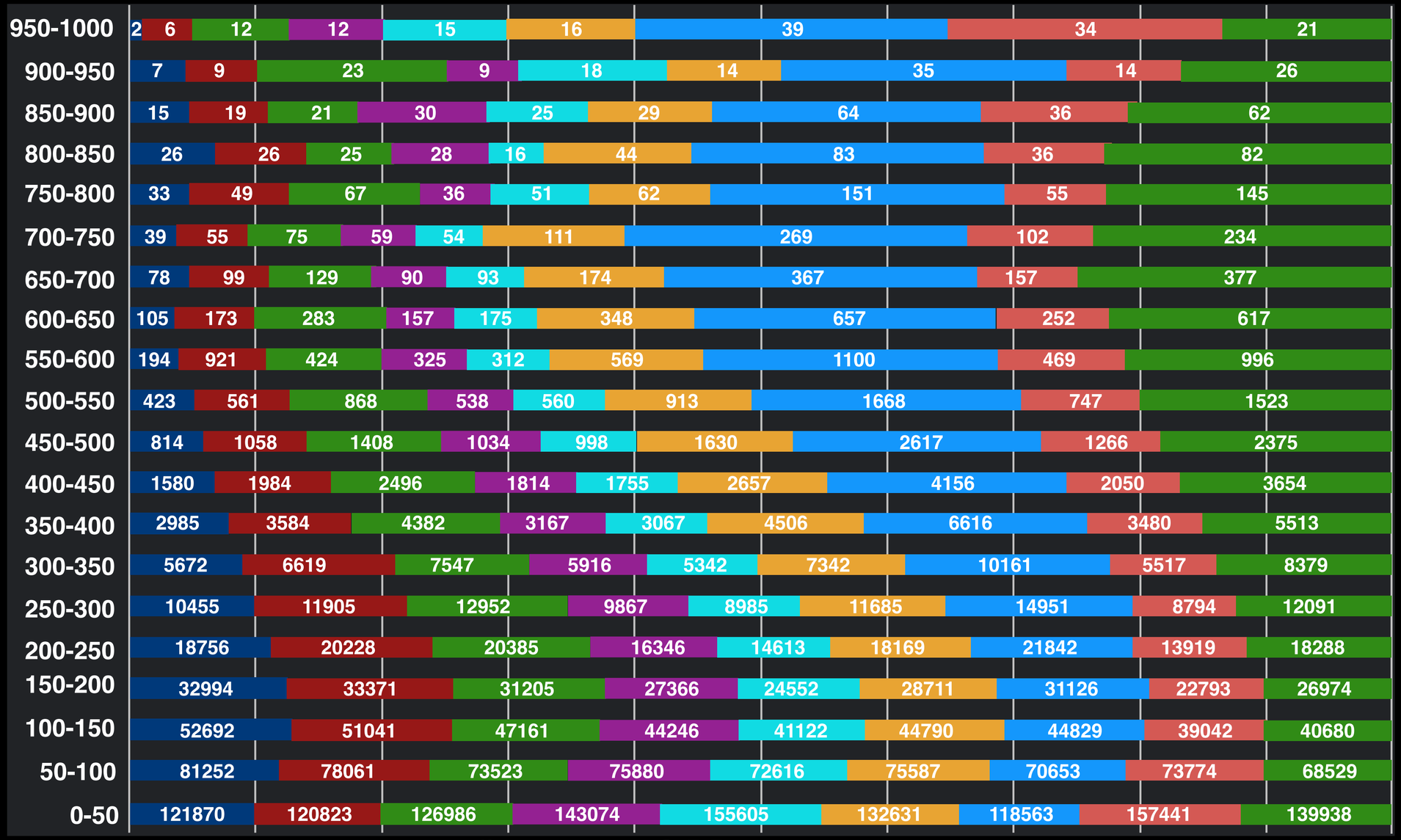
Microbursts



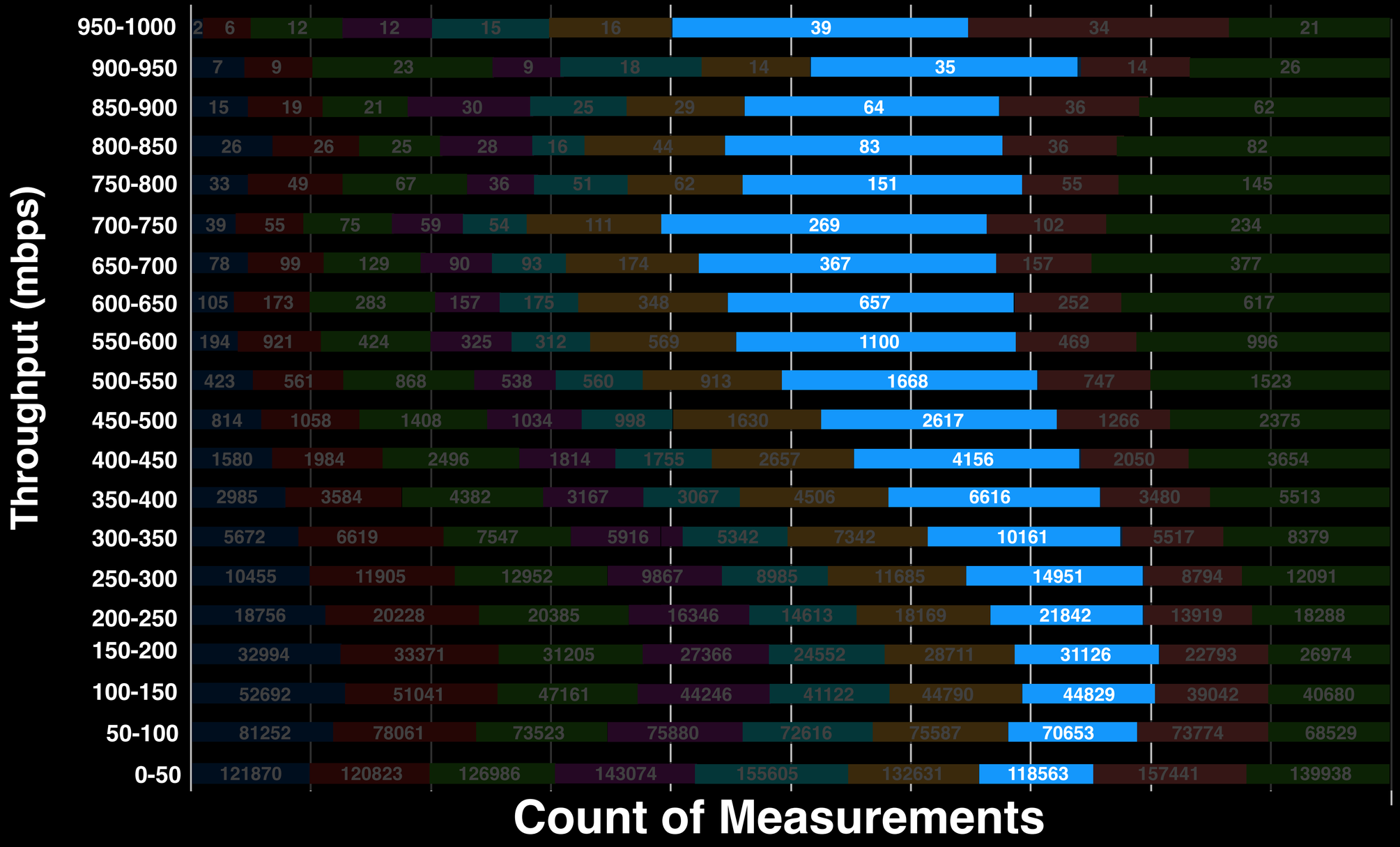
Microbursts



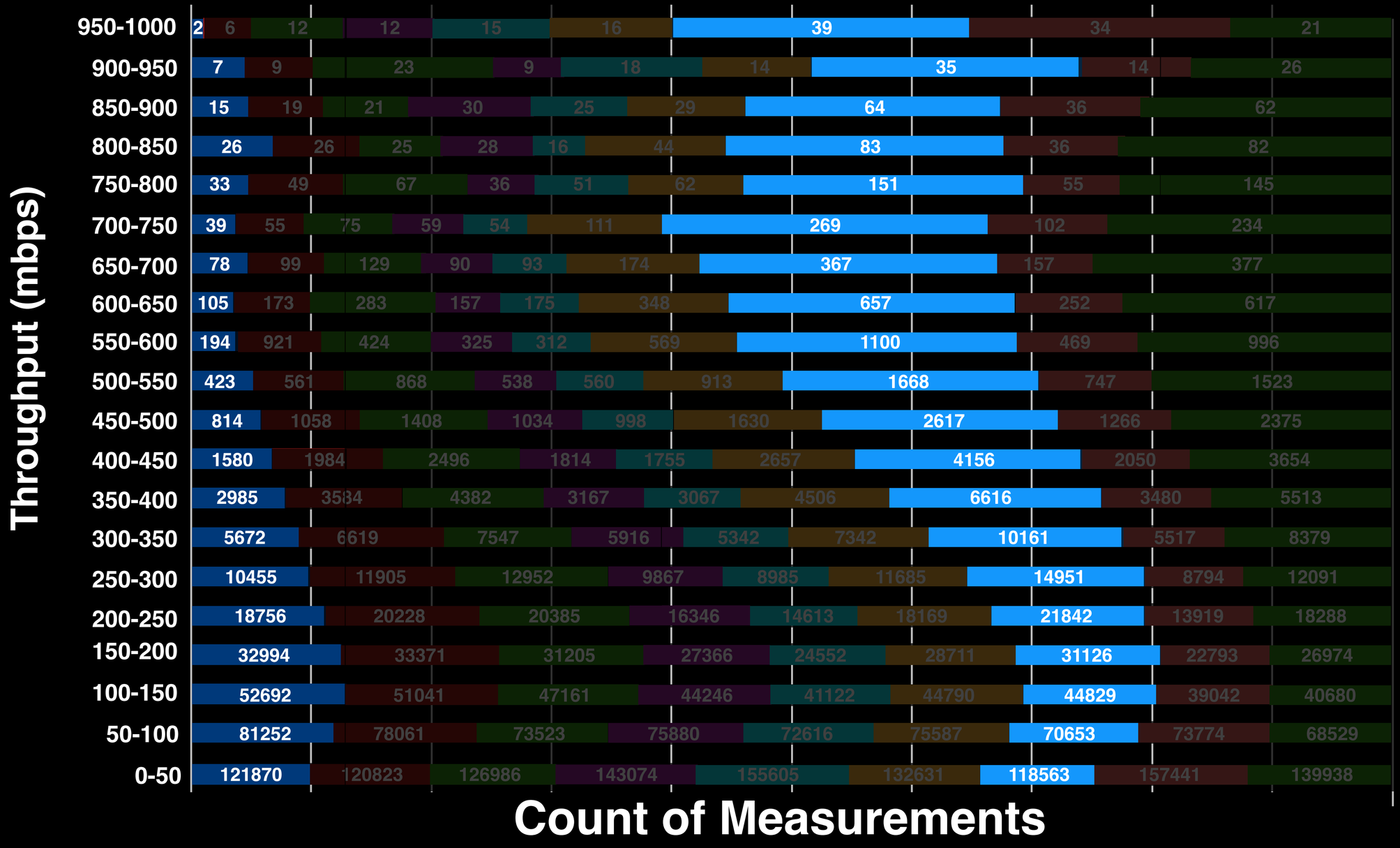
Microbursts



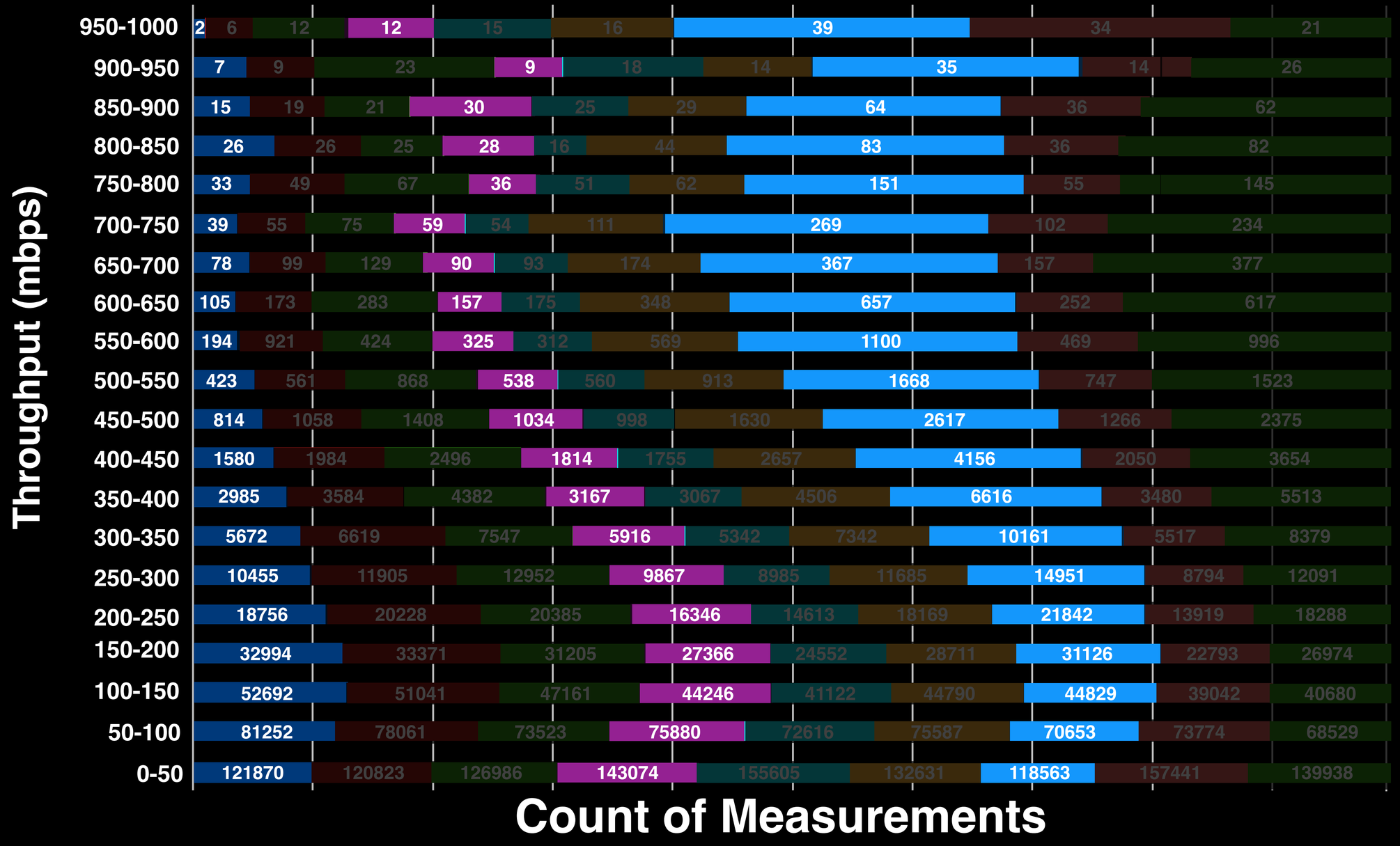
Microbursts



Microbursts



Microbursts

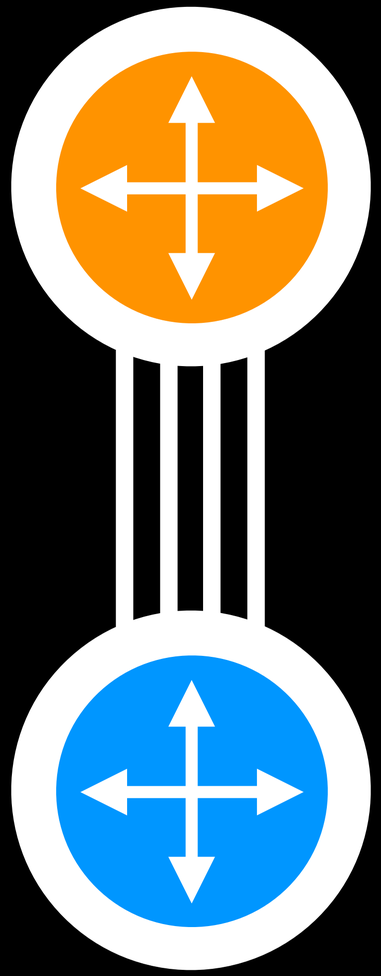


Microbursts - Lessons Learned

- Resolved issues
- Root Cause
- Software helps
- Service owner identified
- Resolution time
- Small loss, significant impact

Link imbalance

link imbalance

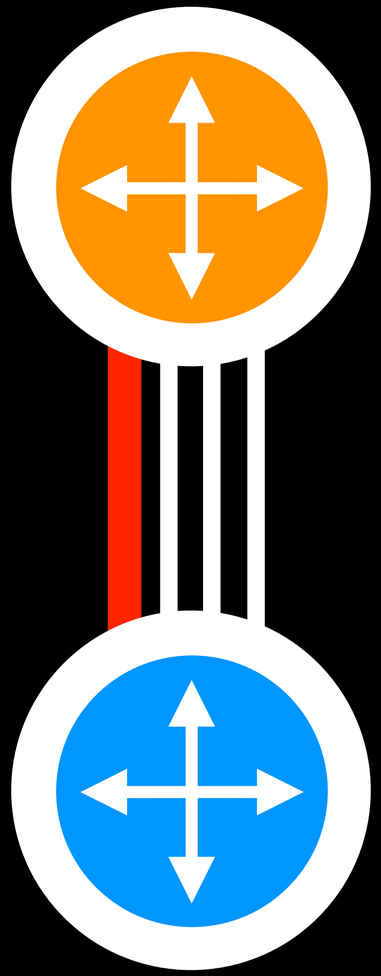


link imbalance

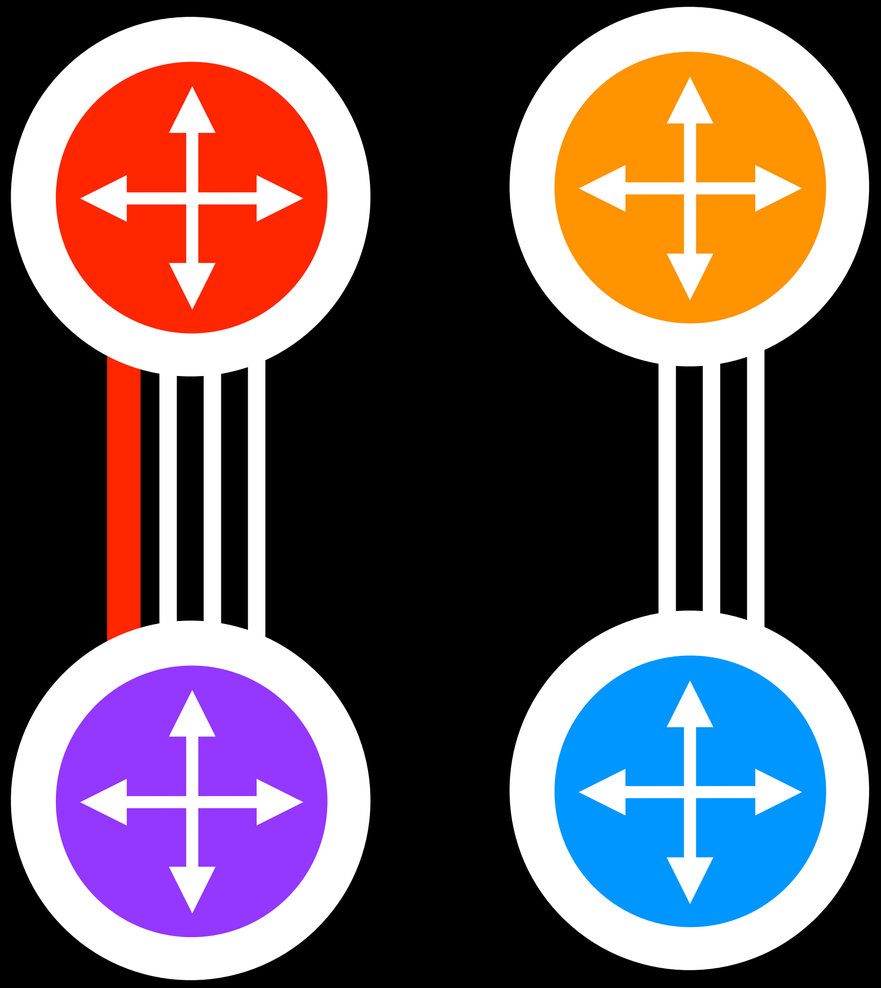
link imbalance

wtf.

link imbalance



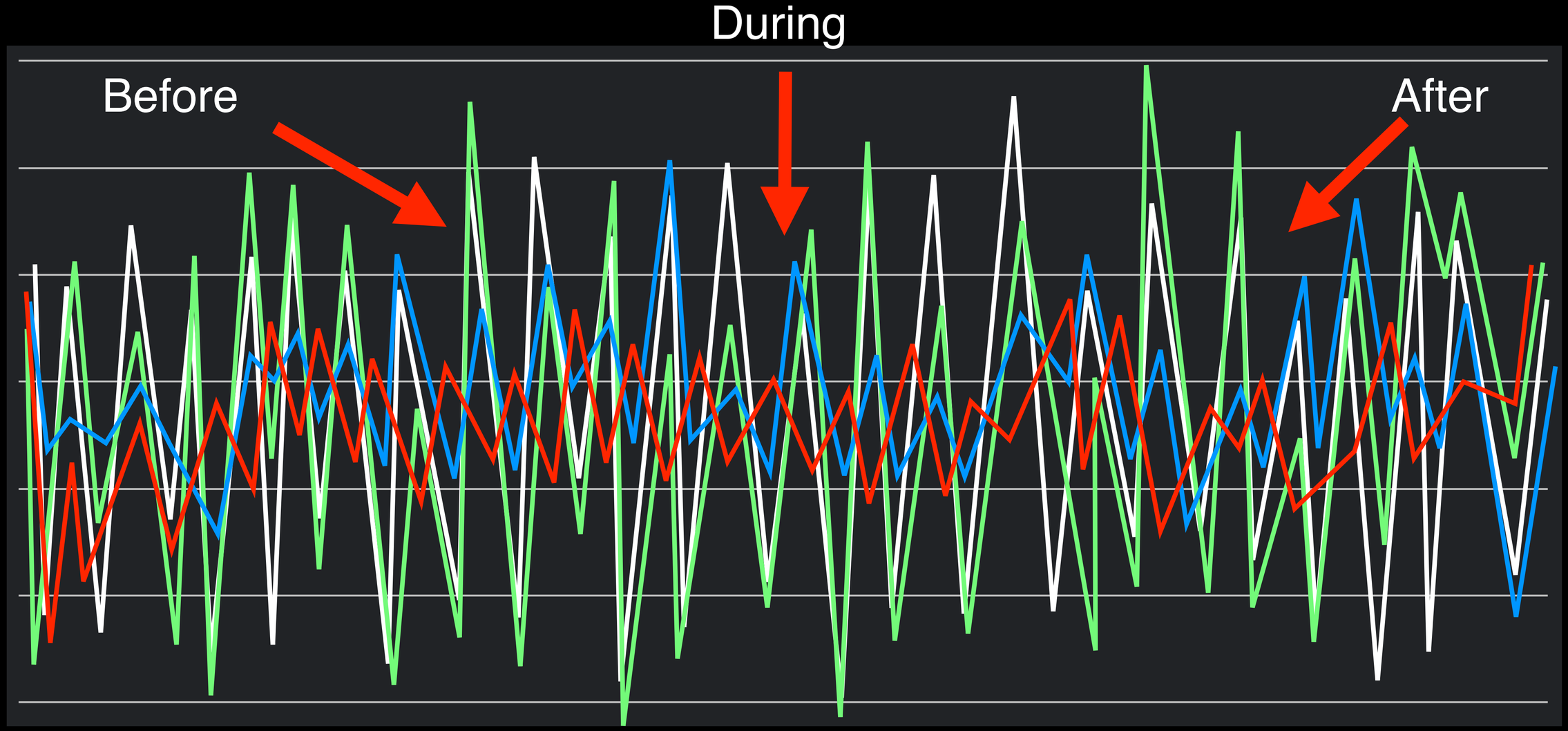
link imbalance



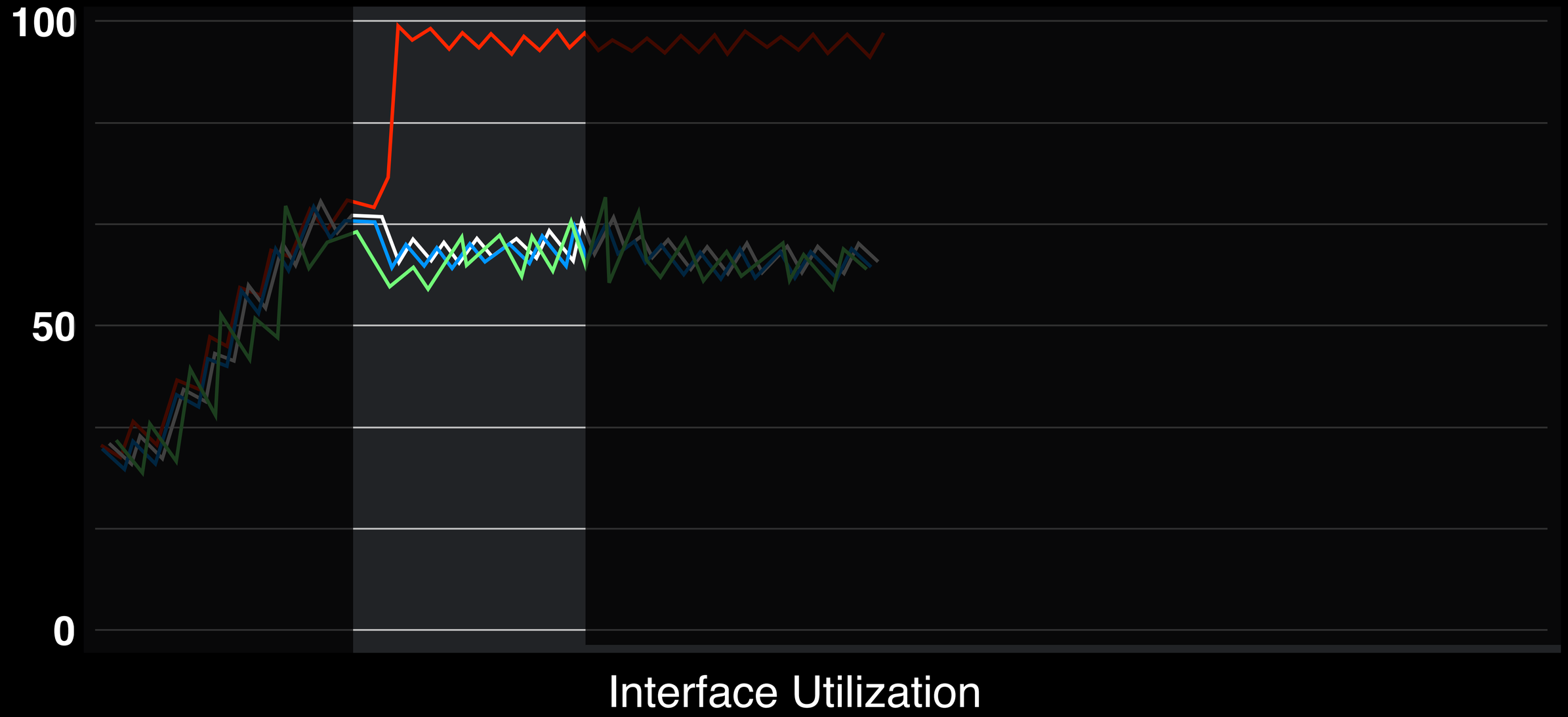
link imbalance

It’s not a [censored] fat flow!

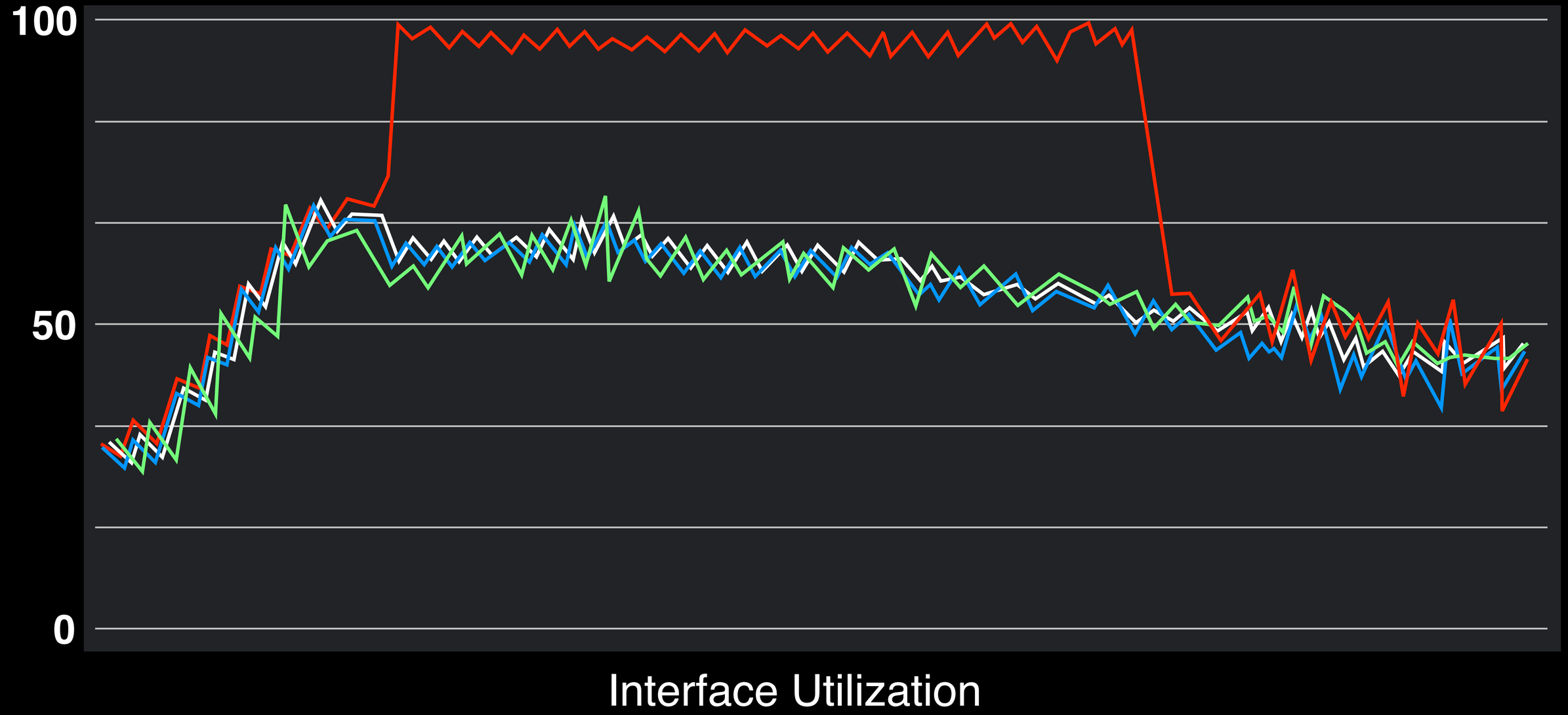
link imbalance



link imbalance



link imbalance



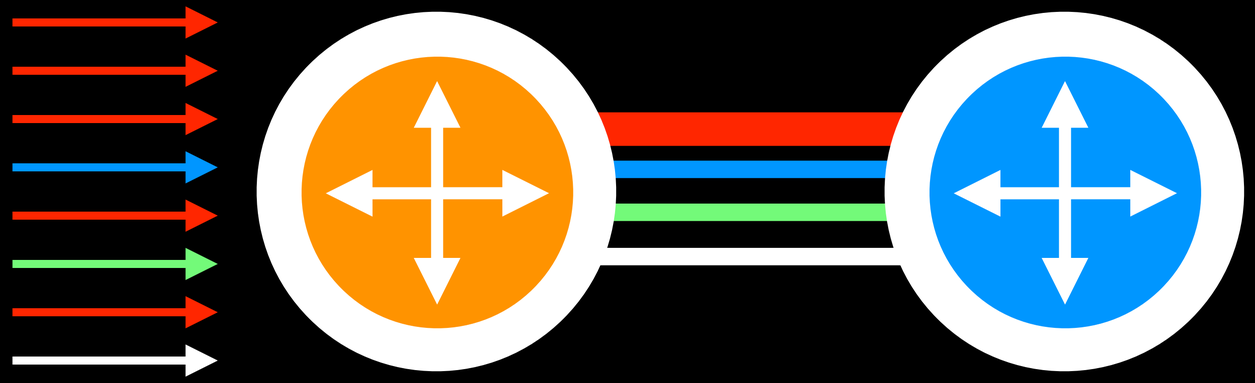
link imbalance

srsly wtf.

link imbalance

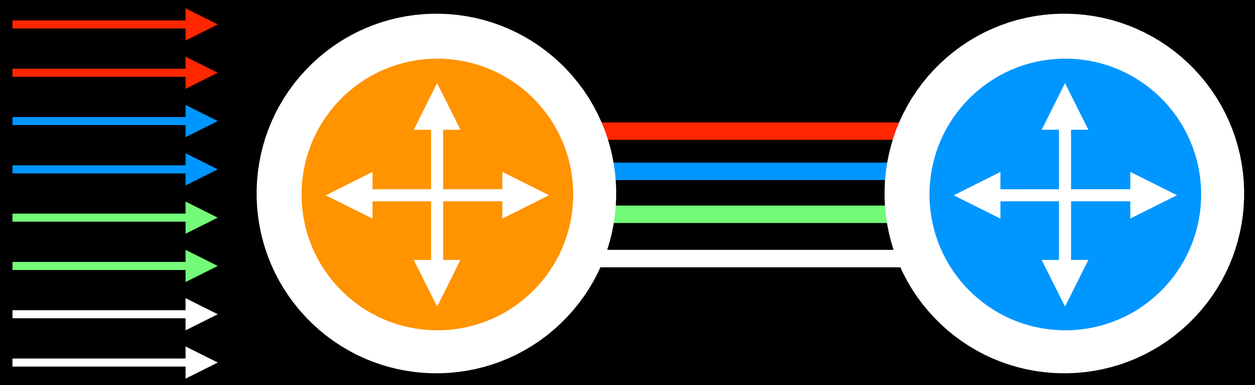
- BB Only
- >80%+ Util
- Migratory

link imbalance



Roll Hash

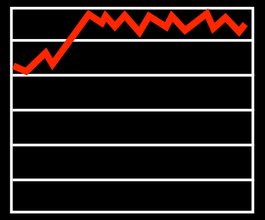
link imbalance



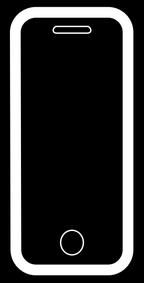
link imbalance

fml.

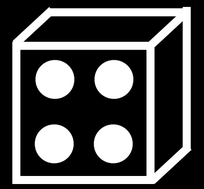
link imbalance



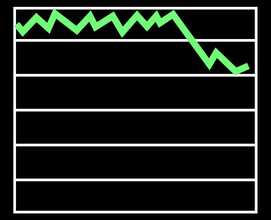
Detect



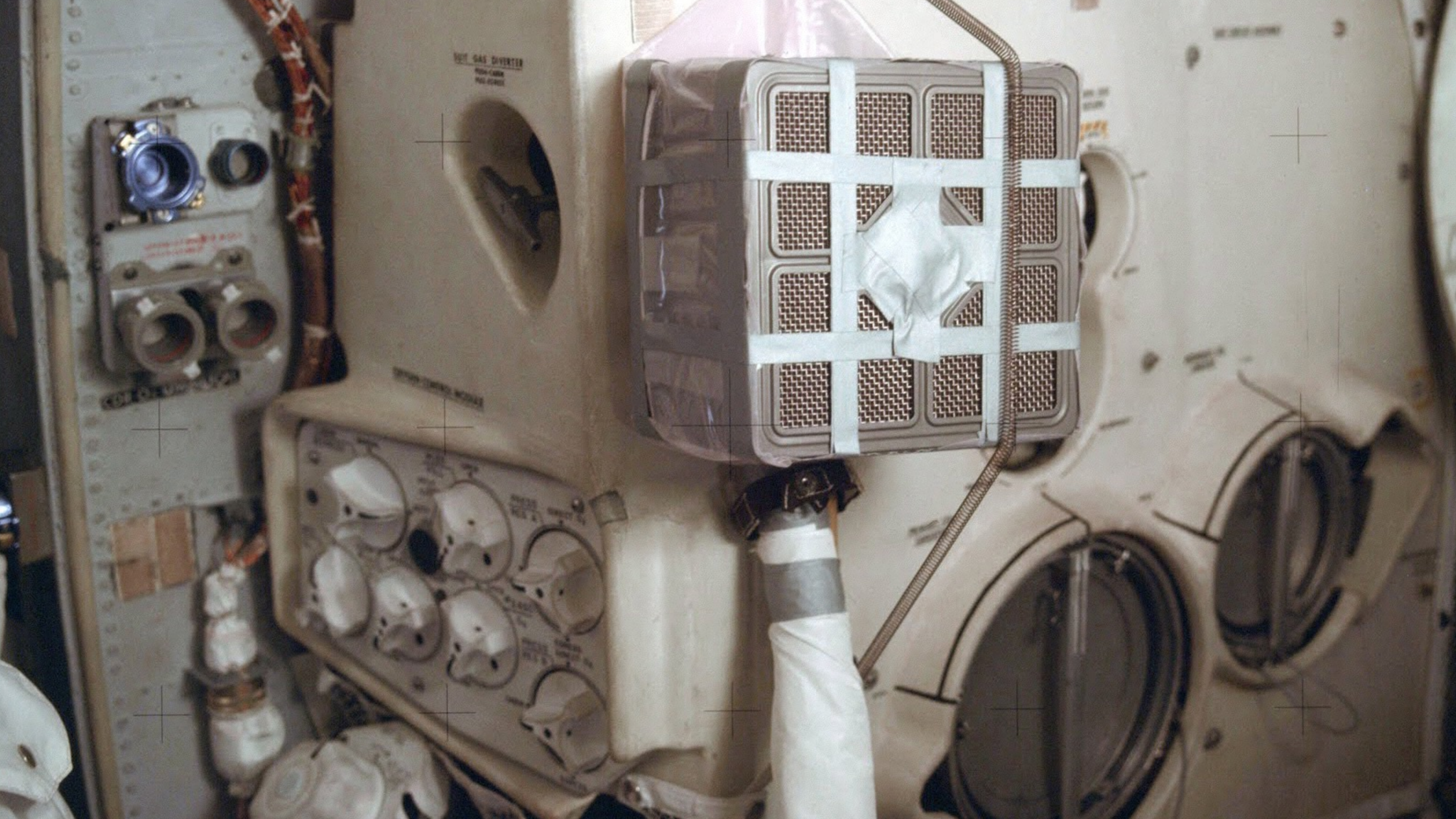
FBAR



Roll Hash



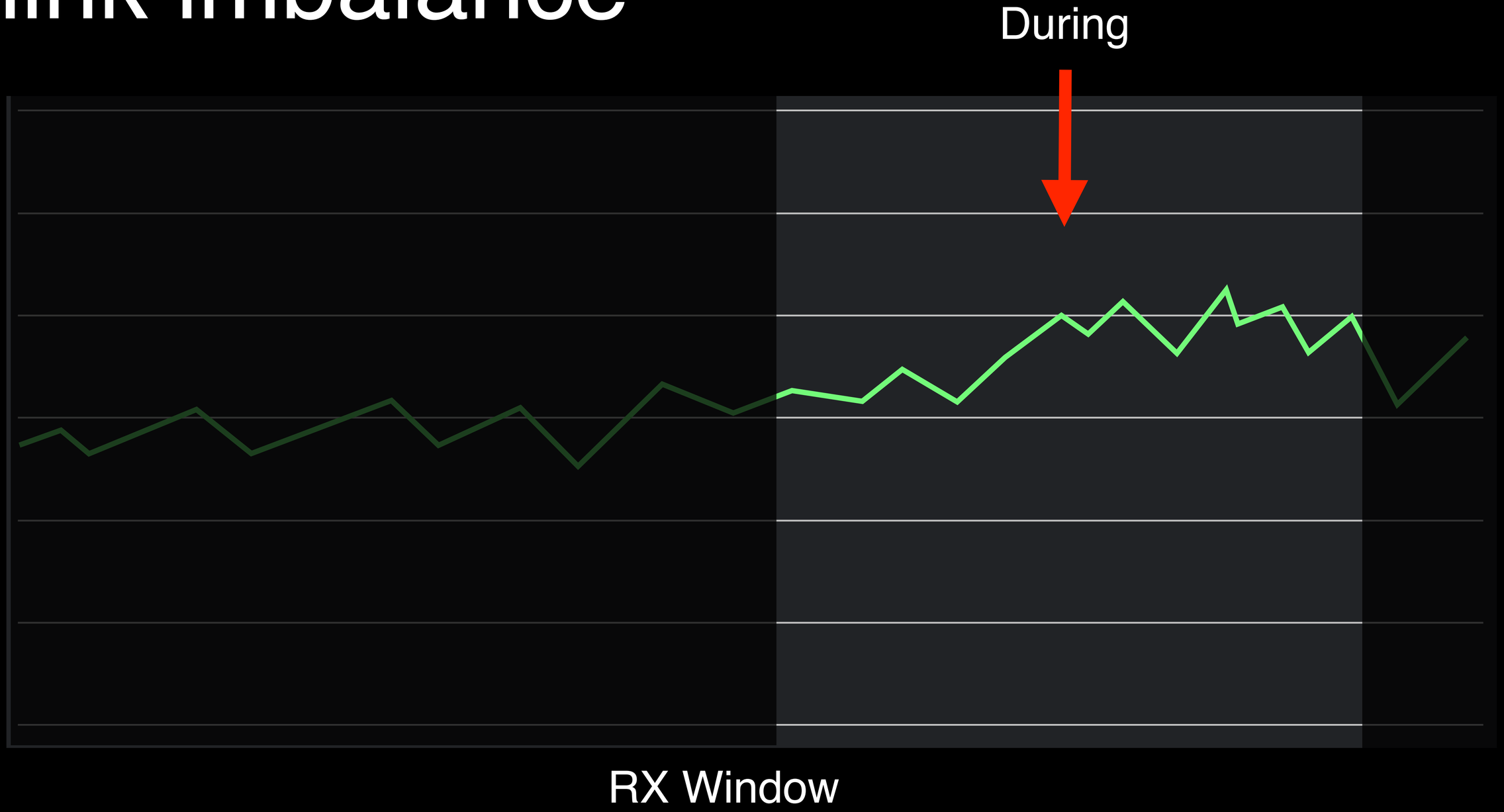
Resolved


HOT GAS DIVERTER

link imbalance

ZOMG!! WTF!! NO, NO, NO! &(#$&*(

link imbalance



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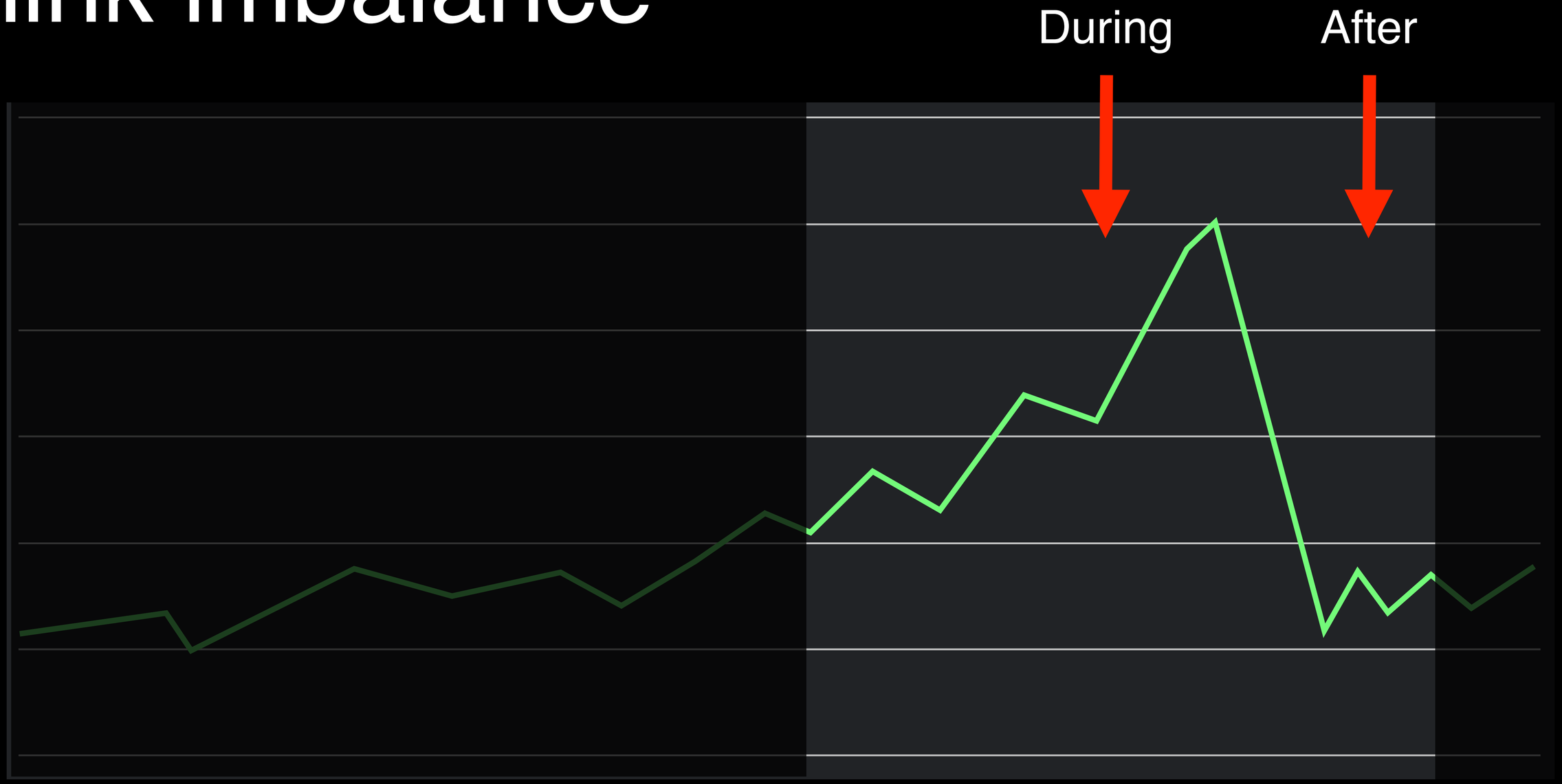
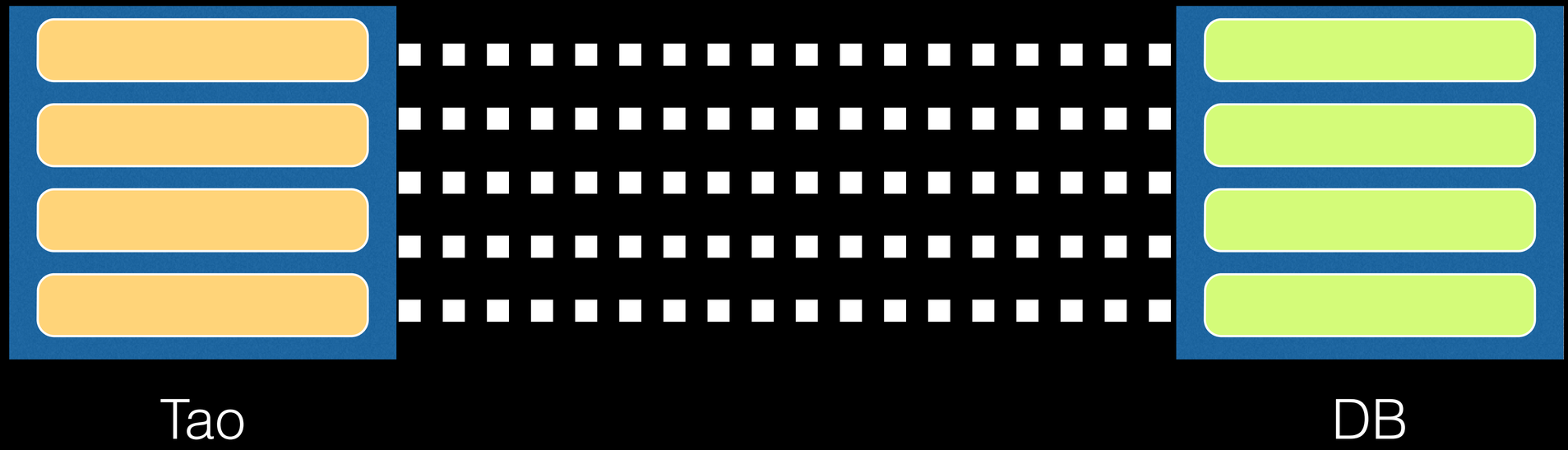
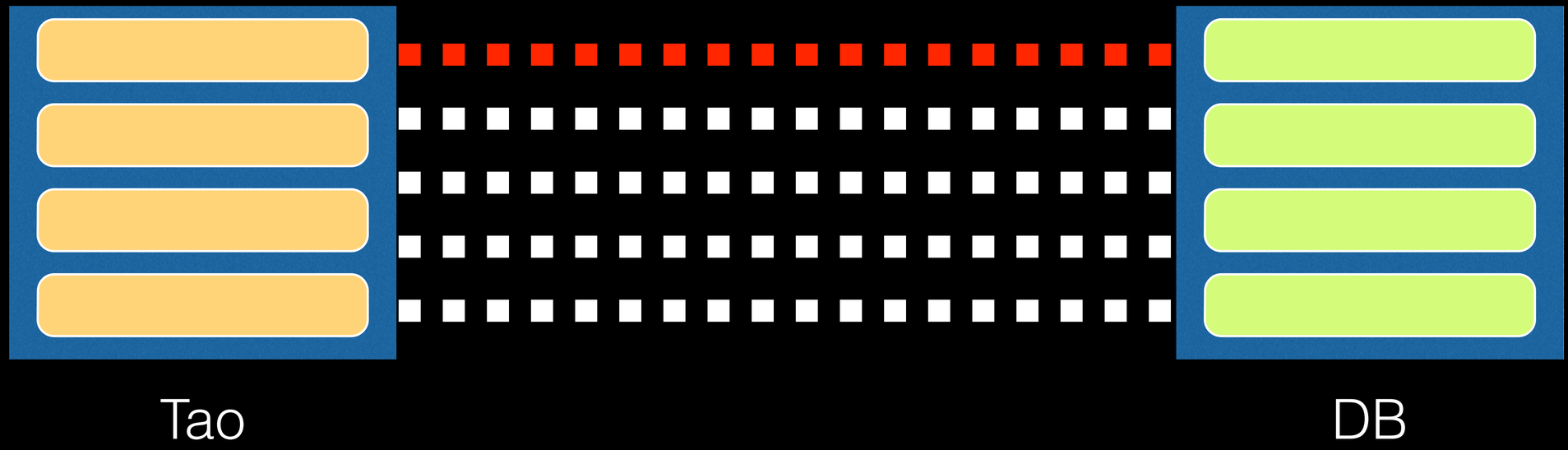



Tao
DB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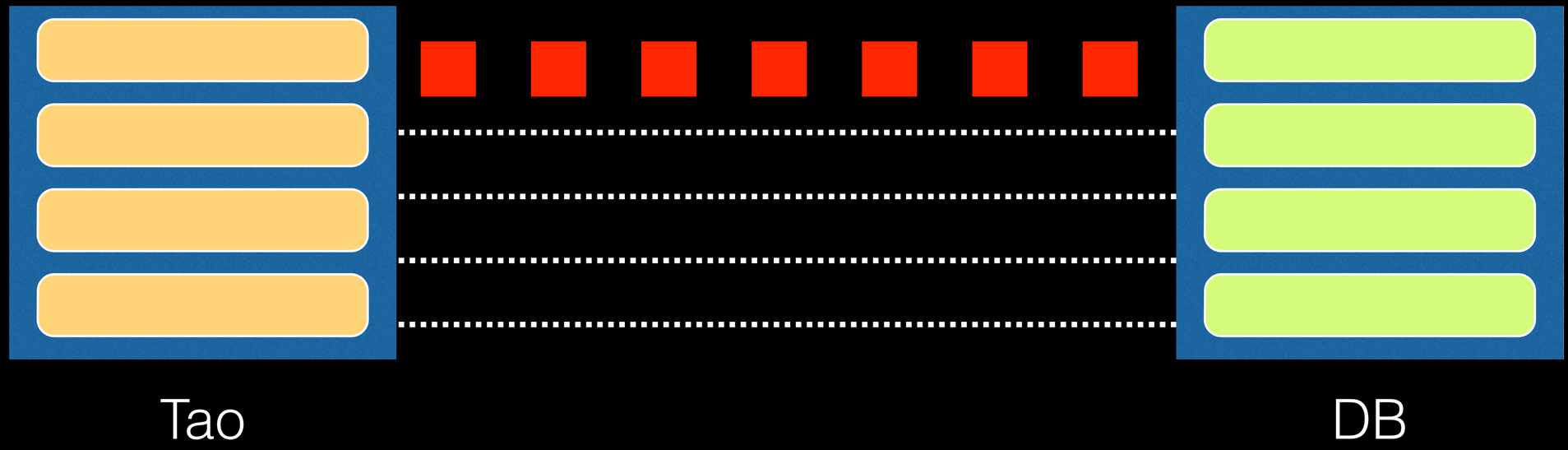
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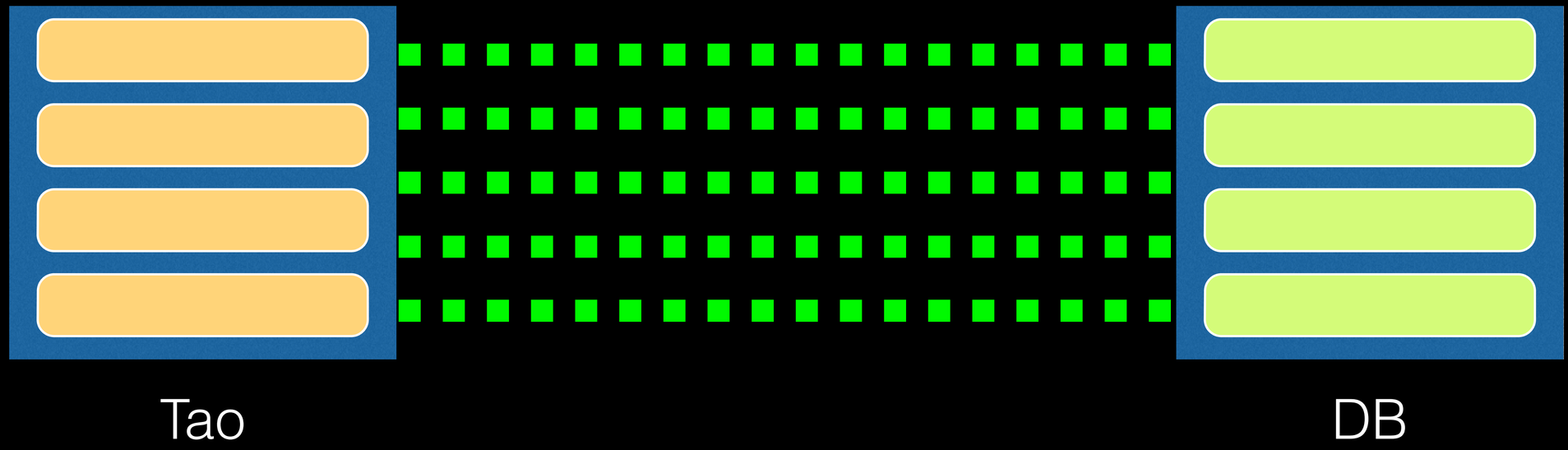
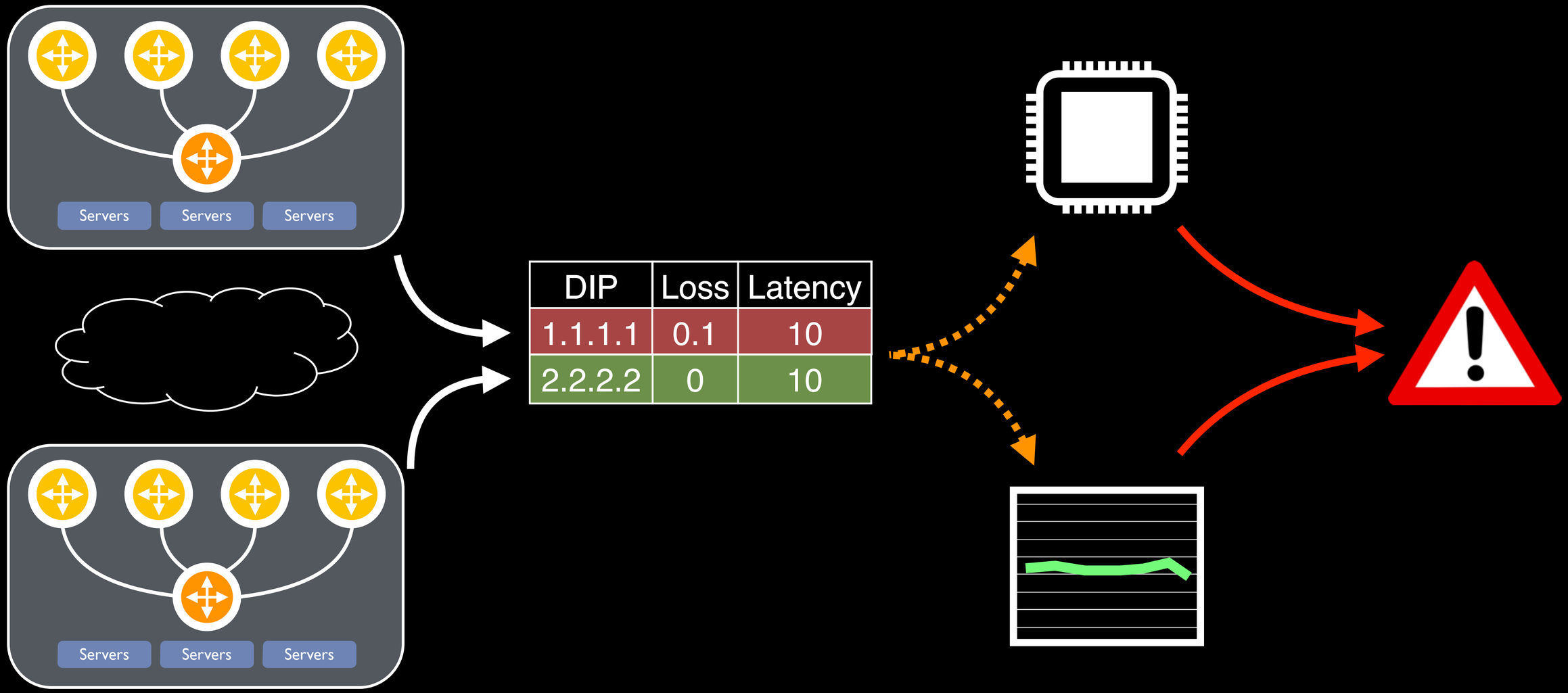

Tao
DB

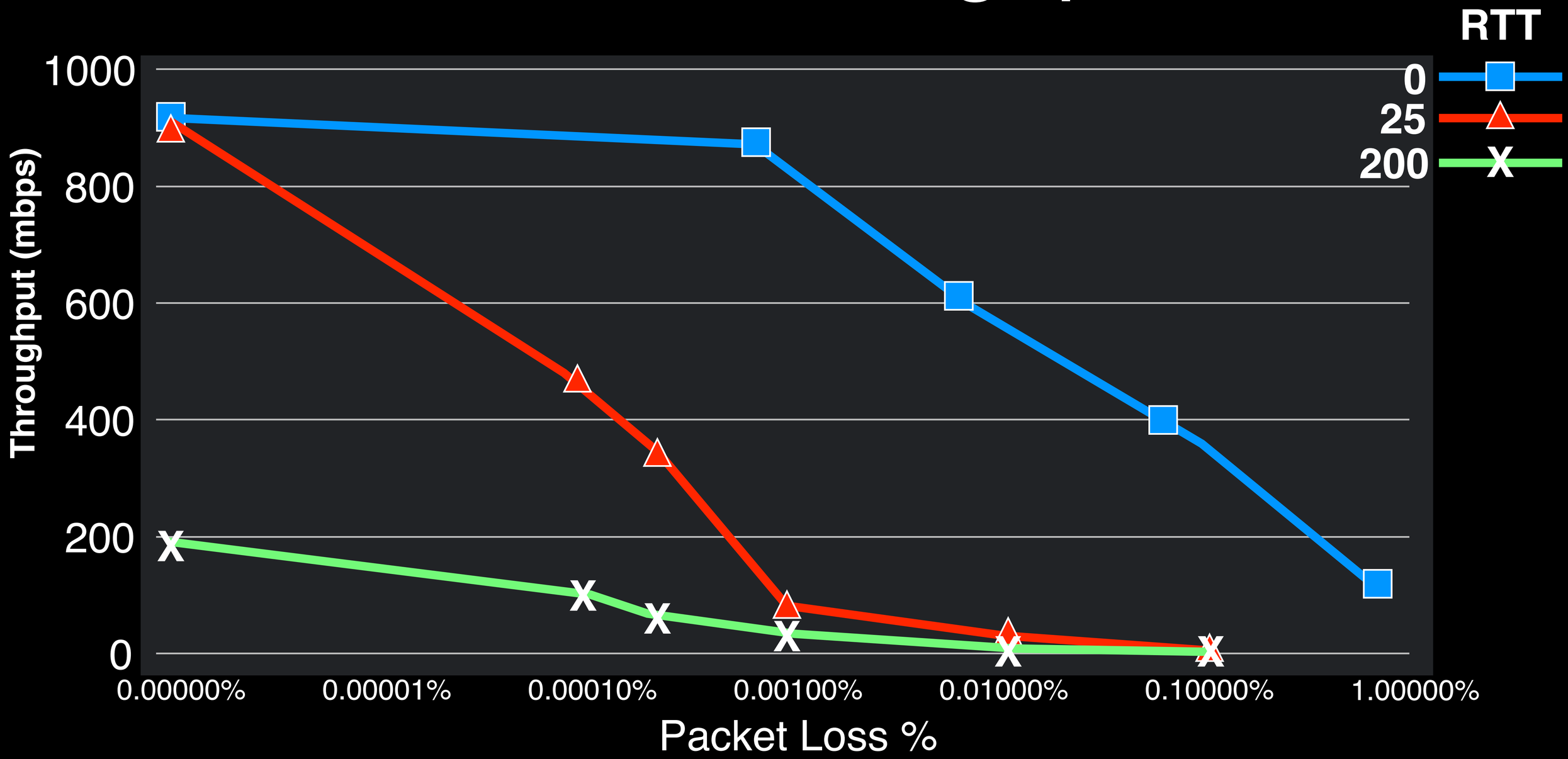
Link Imbalance - Lessons Learned

- Resolved issues
- Root Cause
- Software helps
- Service owner identified
- Resolution time
- Small loss, significant impact

Detection


Servers
Servers
Servers
DIP
Loss
Latency
1.1.1.1
0.1
10
2.2.2.2
0
10
Servers
Servers
Servers

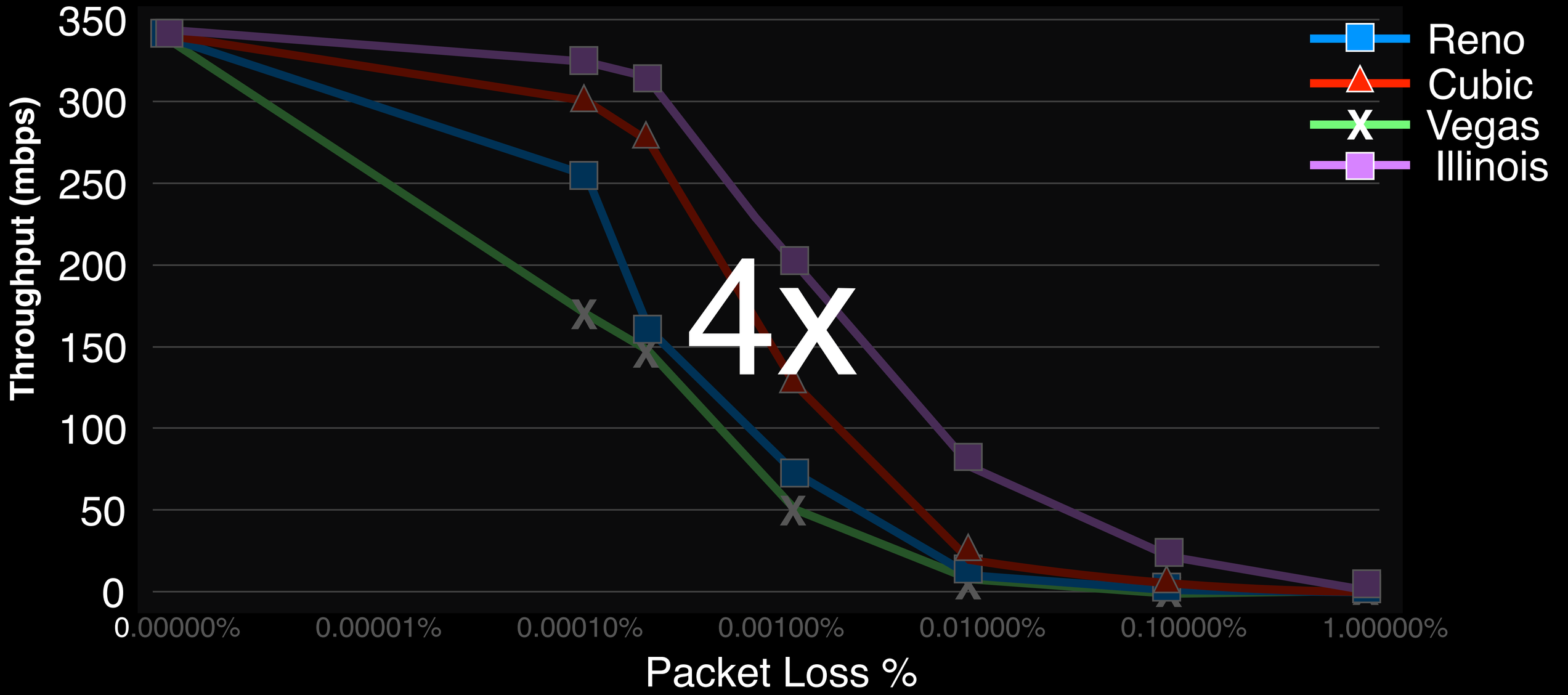
loss effects on throughput



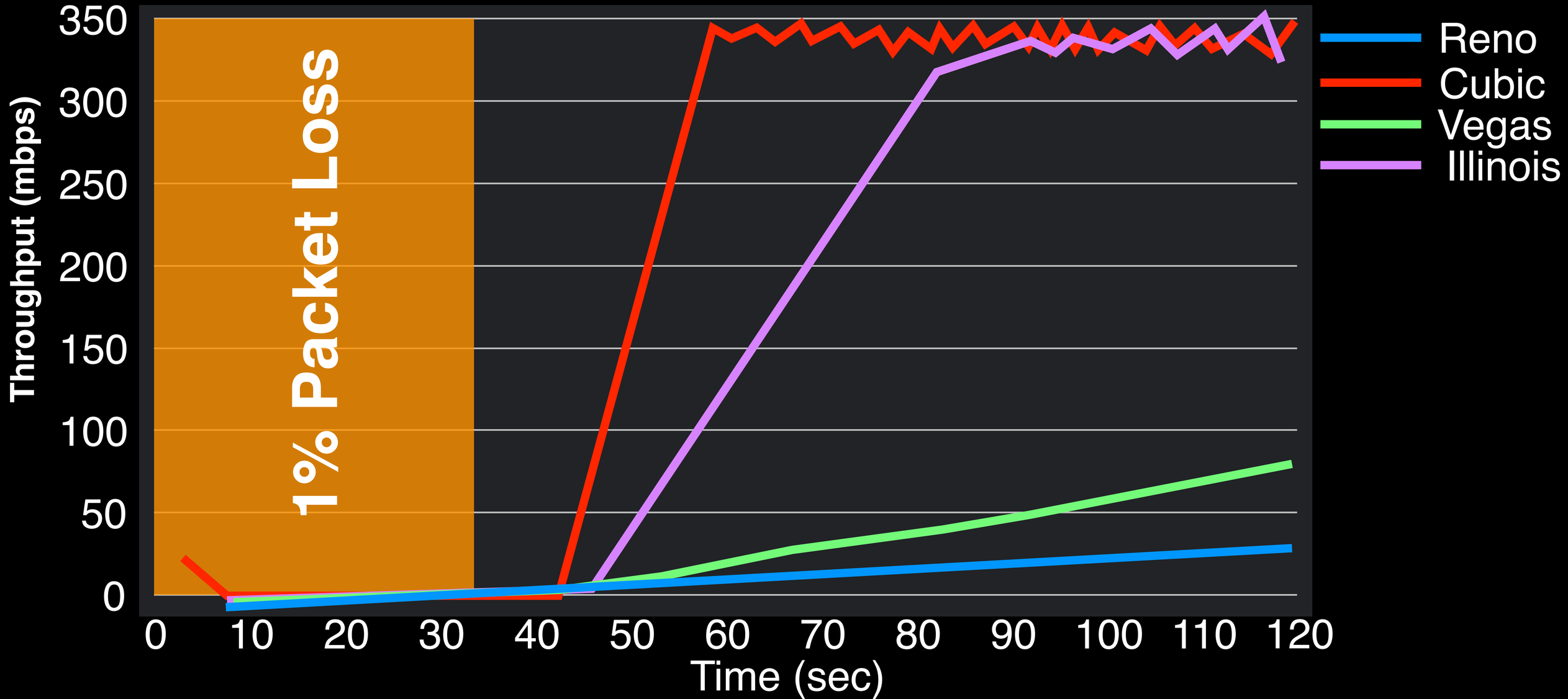
loss effects on throughput

Different algos?

Different algos?



Recovery time



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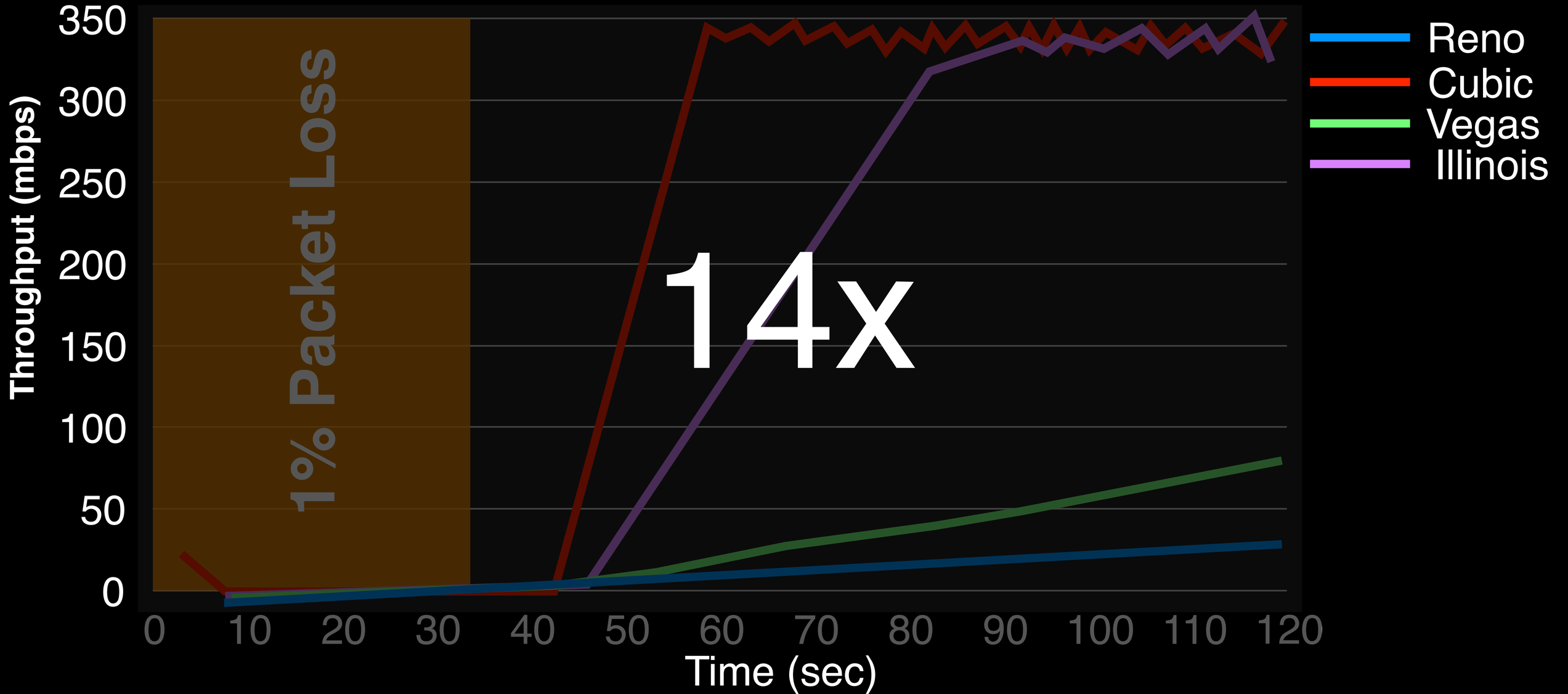
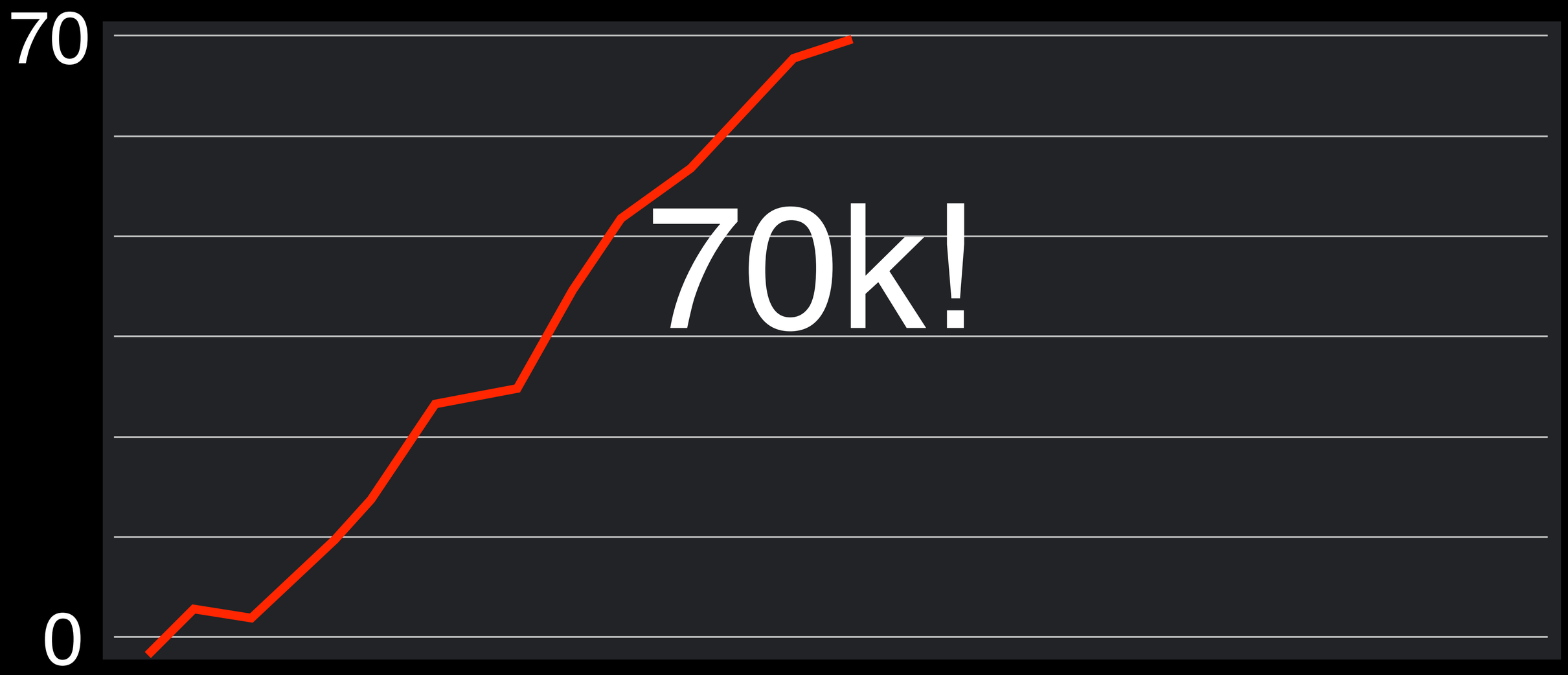
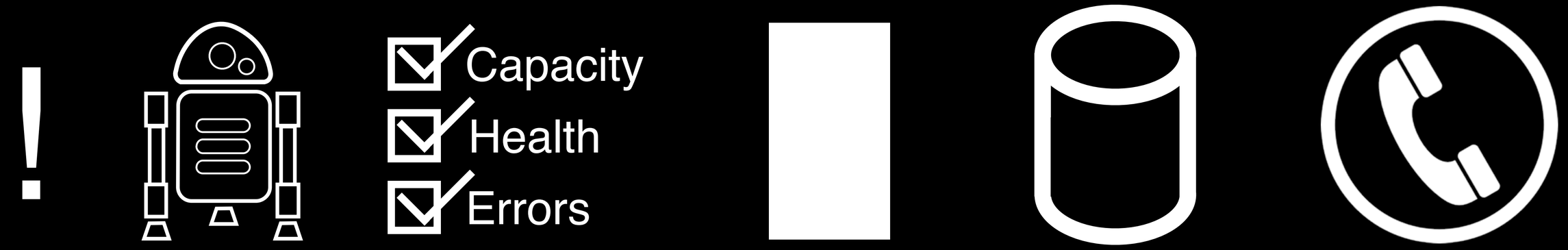


So, wait, how does this apply to me?

Alarms



Interface Issues



Alarms Now

Automation - One Month

3.37b	750k
0.99%	99.6%

Automation - One Month

750,000 * 2 = 1,500,000

1,500,000 / 60 = 25,000

25,000 / 160

150+


Why?

?

How do I start?

NetOps Coding101
Room: Colonial
9:30a-11a
11:30a-1p

fb.com/groups/netengcode

#netengcode